

**ULTRASOUND APPEARANCE OF THE ENDOMETRIUM
AND CLINICAL CORRELATION IN A CASE OF AMENORRHEA**

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ABSTRACT

The subject of this paper is the presentation of a clinical case of amenorrhea in a young woman with regular menstrual cycles and a positive pregnancy test. The ultrasound examination of the uterus at 5 weeks and 1 day after the last menstruation showed the absence of a gestational sac and a thin and hypoechoic endometrium. Since the pregnancy test was positive, the ultrasound examination was repeated after 7 days. During this interval, the patient presented a hemorrhage. The ultrasound performed 4 days after showed a thin endometrium with medium echogenicity. Repeating at 48 hours the measurement of the human chorionic gonadotrophin hormone showed low values that decreased, which correlated with the clinical and ultrasound aspects confirmed the diagnosis of early pregnancy failure.

INTRODUCTION

The endometrium has different ultrasound aspects depending on the phases of the menstrual cycle and the decidual transformation that occurs when a pregnancy develops (Poder 2017).

At 5 weeks of amenorrhea it is important to examine the uterus and ovaries. If the intrauterine presence of the gestational sac is not observed, repeated measurements of the human chorionic gonadotrophin (hCG) are recommended, it being important that they be performed in the same laboratory (RCOG 2012).

A developing pregnancy becomes visible on transvaginal ultrasound at 5 weeks of gestational age, which corresponds to 3 weeks after conception and 5 weeks after the first day of the last menstrual period in a woman with regular 28-day cycles (Porche & Abuhamad 2019).

The ultrasound examination in normal early first trimester pregnancies follows a highly predictable pattern, with a gestational variability of +/-0.5 week: gestational sac at 5.0 weeks, yolk sac at 5.5 weeks and embryo with heartbeat at 6.0 weeks (Doubilet & Benson 2017).

When the human chorionic gonadotrophin test is positive but ultrasound demonstrate neither intrauterine or ectopic pregnancy, the diagnostic possibilities are a normal intrauterine pregnancy that is too early to be visualised, a failed intrauterine pregnancy or an ectopic pregnancy (Doubilet et al. 2013).

MATERIAL AND METHODS

The objective of this study was to evaluate the appearance of the endometrium and ovaries by ultrasound examination, in a young women aged 20 years. The examinations were performed on day 11 of a normal menstrual cycle, after a period of 36 days (5 weeks and 1 day) of amenorrhea and 4 days after a bleeding that occurred after 42 days of amenorrhea.

The ultrasound age was performed transvaginally using a 6.5 MHz transducer and an Siemens Aloka-5-alfa ultrasound. The results of the ultrasound examinations were correlated with the data obtained at the clinical examination and with the human chorionic gonadotrophin hormone values. The chorionic gonadotrophin dosages were performed after the onset of bleeding, at 42 days of amenorrhea. The patient performed a commercial pregnancy test at home, the result of which was positive. Two dosages of the chorionic gonadotrophin were performed at an interval of 48 hours.

RESULTS AND DISCUSSIONS

The ultrasound examination performed on day 11 of a normal menstrual cycle showed the following aspects.

The uterine body was placed in anteversoflexion position, with dimensions of 4 cm/ 3.53 cm and regular outline. The cervix had dimensions of 2.17cm/ 2.31 cm and a linear endocervical canal. The myometrium had a homogeneous appearance and a thickened posterior wall with a thickness of 1.97 cm. The endometrium had an echogenic appearance, with a thickness of 0.17 cm (Figure 1).

The right ovary showed differentiation between the cortical and medullary areas, a size of 3.81 cm/ 2.54 cm and small ovarian follicles between 5 and 11 mm in size (Figure 2).

The left ovary had a similar appearance and dimensions of 3.69 cm/ 2.58 cm (Figure 3).

No fluid was visualized in the Douglas space.

Ultrasound examination performed on day 36 of amenorrhea showed a hypoechoic endometrium, with a thickness of 1 cm (Figure 4).

The right ovary had dimensions of 3.64 cm/ 2.34 cm. In the cortical area, a hypoechoic image with an anfractuous outline and dimensions of 1.91 cm/ 1.23 cm was observed, an image that suggests the presence of the corpus luteum.

The endometrium had an abnormal appearance and a thickness that was to small compared to what a decidual transformed endometrium must have and necessary for the implantation of a pregnancy.

A developing pregnancy usually becomes visible on transvaginal ultrasound at 5 weeks of gestational age (Doubilet & Benson 2017).

The ultrasound examination performed 4 days after the onset of hemorrhage showed an endometrium with an echogenic appearance, but very thin, with a thickness of 1.7 mm (Figure 5).

The right ovary had dimensions of 2.92 cm/ 1.88 cm and 3-4 small follicles in the cortical area, with diameters between 5 and 7 mm. The left ovary had dimensions of 3.43 cm/ 1.84 cm and small follicles.

The appearance and the thickness of the endometrium showed that the pregnancy did not develop and that it was probably eliminated during the hemorrhage, which defines the menstrual abortion or early pregnancy failure.

Human chorionic gonadotrophin hormone dosages at 48-hour intervals showed values of 26 mUI/ ml and then 9.56 mUI/ ml, values that correlate with clinical data and the appearance of the endometrium, confirming the diagnosis.

A single hCG measurement does not distinguish a failed intrauterine pregnancy from an ectopic pregnancy (Doubilet & Benson 2017).

When a pregnancy occurs, the decidual transformation of the endometrium occurs due to the progesterone hormone produced by the corpus luteum. For this reason, the endometrium has a hyperechoic appearance on ultrasound (Pelinescu-Onciul & Bari 2005).

Pregnancy loss between the moment of conception and 9 weeks and 6 days of amenorrhea defines early first trimester abortion, early pregnancy failure or miscarriage (Perriera et al. 2019).

At least 15-20% of implanted pregnancies end in early miscarriage, but most are not diagnosed clinically because they manifest as delayed menstrual bleeding (ACOG 2015).

The most important factors for a normal implantation are the quality of the oocyte and the normal karyotype, more than the morphological or physiological changes in the uterus (Perriera et al. 2019).

Loss of pregnancy can occur at any time during pregnancy, but is most common during the early first trimester. There are no evidence to support the routine administration of progesterone to prevent early pregnancy loss (Hass & Ramsey 2013).



Figure 1. The ultrasound appearance of the endometrium on day 11 of the normal menstrual cycle – sagittal section of the uterus



Figure 2. The ultrasound appearance of the right ovary on day 11 of the menstrual cycle



Figure 3. The ultrasound appearance of the left ovary on day 11 of the menstrual cycle



Figure 4. The ultrasound appearance of the endometrium after 36 days of amenorrhea



Figure 5. The ultrasound appearance of the endometrium 4 days after the onset of hemorrhage

CONCLUSIONS

It is very important to perform a pregnancy test and an ultrasound examination in case of a period of amenorrhea, and the women should be educated to present themselves for clinical and ultrasound examinations every time when occur changes in a regular menstrual cycle.

Correlating the morphological aspects of the endometrium and ovaries observed during the follow-up ultrasound scan with the repeated gonadotrophin measurements can allow positive and differential diagnosis, especially with ectopic pregnancy that can become a surgical emergency.

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